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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,647	03/20/2001	Josef Michl	23-00	3320

23713 7590 11/14/2002

GREENLEE WINNER AND SULLIVAN P C  
5370 MANHATTAN CIRCLE  
SUITE 201  
BOULDER, CO 80303

EXAMINER

CUEVAS, PEDRO J

ART UNIT PAPER NUMBER

2834

DATE MAILED: 11/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/812,647

**Applicant(s)**

MICHL ET AL.

**Examiner**

Pedro J. Cuevas

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 21-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-20 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the claims of group I are generic for the claims in Groups II, III, and IV, which represent species of that genus. This is not found persuasive because claim does not requires the chemical structures of Groups II, III, and IV. Claim 1 is not generic to all four groups because each group has it's own and patentably distinct independent claim.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 21-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 6.

### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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6. The term “substantially” in claims 1 and 2 is a relative term, which renders the claim indefinite. The term “substantially” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
7. Claim 3 recites the limitation “2D” in line 11. There is insufficient antecedent basis for this limitation in the claim.
8. The term “about” in claim 3 is a relative term, which renders the claim indefinite. The term “about” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
9. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how the rotor produce electric current when it rotates upon excitation by an alternating electric field, which was created by electric current applied to the coils.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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11. Claims 1-4, 11, and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,204,573 A to Bederson et al.

Bederson et al. clearly teaches the construction of a two-dimensional pointing motor comprising:

a base (15);

a transition metal axle (13) connected to said base and oriented substantially perpendicular to said base;

a rotor portion (12) having an electric dipole moment greater than about 2D and substantially in the plane perpendicular to the axle;

a bearing (column 4, lines 22-23) connecting the axle and the rotor portion; and

an excitation (motor drive of Figure 9, electrical force) source that can induce movement of the rotor portion of the dipolar rotor.

12. With regards to claim 20, the motor disclosed by Bederson et al. will produce electric current in the coils (A, B, C) if magnets (12) are rotated by creating an alternating magnetic field. This is just using the motor as a generator, or reversing the electromagnetic cycle to obtain electric current from moving magnets.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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14. Claims 5-10, 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,204,573 A to Bederson et al. in view of Transition Metal-Containing Rotaxanes and Catenanes in Motion: Toward Molecular Machines and Motors, American Chemical Society's Accounts Of Chemical Research / Vol. 31, No. 10, 1998, PP 611-619 from Jean-Pierre Sauvage.

Bederson et al. disclose the construction of a two-dimensional pointing motor as described above.

However, it fails to disclose a motor wherein:

said bearing is a metal-to-n-face bond;

said base can be:

covalently attached to a dielectric surface,

a carbon atom,

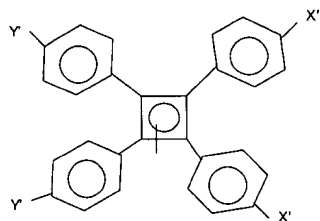
a silicon atom;

said axle can be:

a single bond,

a triple bond;

said rotor is a substituted aromatic ring and comprises two or more substituents with opposite charges, wherein said substituents with opposite charges give the molecule a large dipole having the following structure,



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where X' is a positively charged substituent and Y' is a negatively charged substituent.

Sauvage teach the use of transition metal-containing rotaxanes and catenanes for the purpose of constructing molecular machines and motors having:

metal-to-n-face bond bearings;

covalently attached bases, which can be carbon or silicon atoms, to dielectric surfaces;

single or triple bond axles;

substituted aromatic ring rotor comprising two or more substituents with opposite charges, wherein said substituents with opposite charges give the molecule a large dipole having the previous structure, where X' is a positively charged substituent and Y' is a negatively charged substituent.

It would have been obvious to one skilled in the art at the time the invention was made to use the transition metal-containing rotaxanes and catenanes disclosed by Sauvage on a small-scale two-dimensional pointing motor having the characteristics disclosed by Bederson et al. for the purpose of constructing molecular machines and motors.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas  
November 6, 2002

